Lincoln Savage Middle School

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NOVEMBER 2011

Dear Parents:

Have you ever heard your son or daughter say, "I hate math"? As a former math teacher I probably heard it more than I care to remember. One thing that always helped students appreciate math more was by explaining why they needed to learn it or how it applied to life. The biggest hurdle for a middle school student may not be their ability to do math, but making it relevant.

We are trying to do our part at Lincoln Savage Middle School in making mathematics more real to everyday life. What can you do to help? Maybe you can find ways to show your son or daughter how you use math in your work? Maybe you can show them how you pay bills at home or calculating the square footage of a new deck you are building next spring? Either way you do it students are learning about math and how it applies life.

Below is a recent article that addresses this issue for middle school students. Maybe we can work together to provide the best math experience possible for your child?

Connecting School Mathematics to Everyday Life

In this intriguing *Middle School Journal* article, DePaul University/Chicago professor Mindy Kalchman addresses the gulf that commonly exists between school mathematics and math in everyday life. One dramatic example from the research is young Brazilian street merchants who were able to solve complex, multistep problems involving money, but couldn't do the same computation in a school setting. The same school/life gap exists among many American children, adolescents, and adults.

"One reason behind this discrepancy," says Kalchman, "is that most mathematics programs and assessments require students to consider rules and laws formulated by others, use symbols or systems determined by others, and resolve problems contrived by others." Textbooks and workbooks earnestly try to make mathematics relevant by including real-life scenarios, but these aren't the same as authentic problems that students encounter while shopping, cooking, and playing sports – situations that require spontaneous and functional application of mathematics.

Kalchman describes a teacher's experiment with Math in Everyday Life (MIEL), a program designed to address the gap. Every Monday, her fifth graders had to hand in a detailed description of an authentic experience they had outside school that required the use of mathematics. Students were asked to describe the mathematical situation and how they approached and solved it, and give the answer. When the teacher launched the idea at the beginning of the year, she gave examples of descriptions that would be acceptable: calculating a tip in a restaurant, adjusting proportions while following a recipe, and calculating tax and discounts in a store. She also said that it would not be enough to add 24 and 13 (for example); students had to explain why 24 + 13 equaled 37 – for example, "13 is the same as 10 plus 3. So, I can add 24 plus 10, which is 34 and then I can add on the other 3. Thirty-four plus 3 is 37".

The teacher also explained that students were not allowed to work on these papers in class, encouraged them to involve family members in the project, announced a Done/Not Done grading policy, and allocated time every Monday for students to share their problems and solutions.

Here were some of the problems students shared: One girl figured out how long it would take to do math homework; later in the year, she figured out when the movie "The Sound of Music" was made and how old her parents were when it was made. A boy calculated the minutes he practiced his French horn; later in the year, he worked out his feet-per-minute speed running a mile.

Kalchman observed and interviewed students at three points during the school year, looked at their work, and analyzed their test scores. Here's what she found:

• Students said the weekly homework assignments opened their eyes to the math they used outside school and made school math easier and more meaningful.

• Students said they felt much better prepared for the high-stakes state tests they took. They felt better able to handle the unpredictability of the test questions and were less nervous about the whole enterprise. They also said they felt more confident and competent with the tests' open-response questions.

• Students actually appreciated having a weekly homework assignment that other fifth graders in the school didn't have, because they believed it gave them an advantage over their peers.

• 71% of students improved in the clarity of their explanations during the year, and 65% improved the complexity of their problems and application of mathematics.

• 76% of students made significant gains on the Measure of Academic Progress (MAP) tests they took three times during the year.

The goal of the MIEL assignments was to get students to recognize, appreciate, apply, solve, and communicate about real-world math, and see themselves as competent and functional mathematicians, independent of (and perhaps in spite of) their success in school math. In that regard, it did triple duty – it connected math to students' everyday lives, built their mathematical self-confidence, and prepared them well for high-stakes tests without engaging in explicit test prep. MIEL also gave their teacher weekly insights into how they were using and processing mathematics – insights that improved her in-school teaching of the subject.

"Using the Math in Everyday Life to Improve Student Learning" by Mindy Kalchman in *Middle School Journal*, September 2011 (Vol. 43, #1, p. 24-31), no free e-link; Kalchman can be reached at mkalchma@depaul.edu